

Smart Signal Controlling for Emergency Services and Stolen Vehicles in City

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Abstract: *Now a day's use vehicle increased rapidly because of that vehicle traffic get increase rapidly and can cause large traffic congestion. In today's world there is no provision to handle the emergency vehicles like ambulance, police van or fire engine which are stuck into traffic jams. Current system providing way to Emergency vehicles manually by using traffic police. Here we are developing a smart signal controlling system for smart city. We are Developing Smart controlling system for Emergency services and Stolen vehicles which will help to decrease the travel time as well as decrease congestion. Also we are gathering environment values like temperature and moisture by using temperature and moisturation sensors from particular area and upon crossing of the threshold value and generating alerts at the server side. If Emergency comes from all side of signals that time deadlock is occurs to handle this deadlock we are implemented an algorithm.*

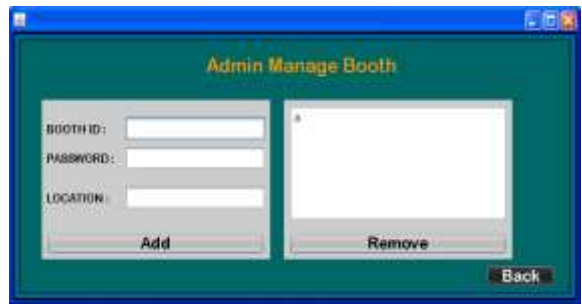
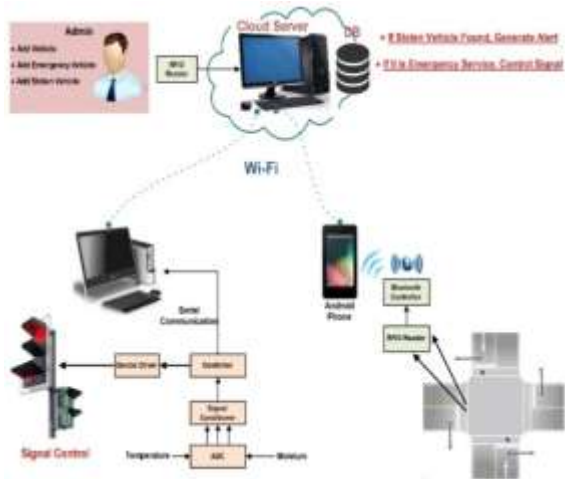
Keywords: Sensors, IoT, RFID, Stolen vehicle, Smart City, Monitoring, Mobility, Emergency vehicle

1. INTRODUCTION

Now a day's vehicles are used for travelling purpose transport purpose for long journey in the India. Now a day's use of vehicle also increase drastically because of that traffic also get increased. If traffic increased then all types of vehicles are get stuck in the traffic. Vehicle can be any type like Emergency vehicle, Normal vehicle and stolen vehicle. The Emergency vehicle driver wants to reach to destination as soon as possible. Emergency vehicle can be type of Ambulance, Police vans, Fire engine vans. If it is Ambulance then it can be used to get patient to the hospital or to drop patient to his

home safely. The Internet of things (IoT) is network of physical devices, vehicles, home appliances and other objects embedded with electronics, software, sensors, actuators, and connectivity which enable to devices or objects to connect and Interchange the data. This paper we propose a system in which all types of vehicles, RFID Reader, RFID tags, sensor are used. The current system related signal controlling is totally manual, It means in current system traffic police need to manage signal for Emergency vehicles manually. So it is time taking and does not guarantee that all emergency vehicle get priority .The proposed system will provide way to Emergency vehicles which is stuck in traffic and capture Environment parameter like temperature, moisture of particular area and also maintaining log of stolen vehicles. RFID reader is place on the road to read RFID tag which unique to all types of vehicles, after reading this tag value it will be sends to admin side by using Bluetooth controller. At admin side this read value get compare if it is Emergency vehicle, stolen vehicle or normal vehicle. If it is Emergency vehicle then control signals accordingly. If it is stolen vehicle then maintain log. In this proposed system we are creating private cloud of admin system and mobile which has android app to send read tag values to admin side. If Emergency vehicles comes from all side of chowk that time deadlock get occur to handle this deadlock we implement algorithm. This algorithm use historical information to handle deadlock. In this algorithm based on maximum count of Emergency vehicle system provide the way to Emergency vehicles whenever deadlock occurs.

1. IMPLEMENTATION



B. Vehicle registration system at server side:

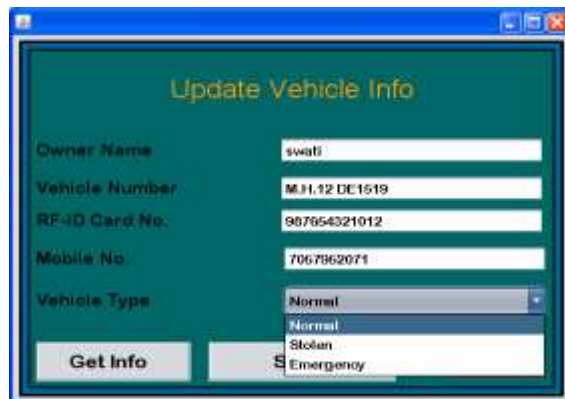
In this system admin get verified means if it is authorized one or not. If it is authorized then not allow to get or update vehicle information. If it is authorized then allow to access, add or update information of vehicles. Authorized person i.e. admin need to enter booth Id and password which is created in Vehicle Authentication system. After verification Admin can add vehicle information and update vehicle information like type of vehicle, vehicle number etc. based on RFID tag number.

In the proposed system at admin side all vehicles are categorized according to its type it means all emergency vehicles, stolen vehicles and normal vehicle are store separately it is done by admin which authority. RFID reader which is place on the road which will read tag value of tag which is unique number given to all types of vehicles to identify which type of vehicle is this. This tag given to vehicles at the time vehicle registration which is place at the bottom of vehicle. This tag value send to admin side by using Bluetooth controller and this tag value get check in all types of vehicle database. If It is Emergency vehicle then controlling signal accordingly. If stolen then maintain log for that and generate alert for stolen vehicle and also capturing environmental values of particular area if the environmental values crosses the threads hold limit then generate alert to admin.

The implementation of proposed system includes following modules:

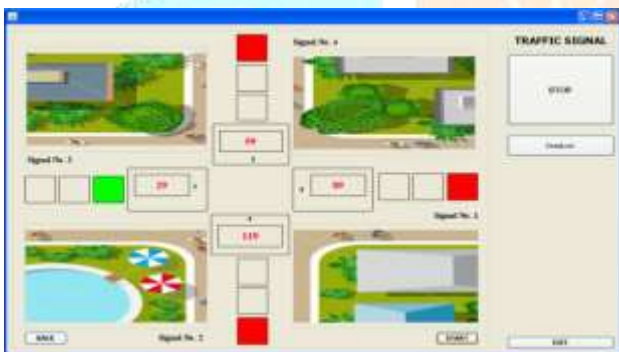
A. Vehicle Authentication system:

In Vehicle Authentication System we are developing a system which is used at all chock to Admin manage booths. in this booth manager need to enter Booth ID ,Password and Location of booth.



C. Traffic module:

In this module we are showing simulation of traffic signal. If read value is of emergency vehicle then signals get switched accordingly. In code this module if a read tag value of vehicle is emergency vehicle then give command to microcontroller to control signal. In Microcontroller embedded code program is store to control signal. In this module we also controlling deadlock occur at chowk means at chowk emergency vehicle is coming from all side at the same time based on historical data so that all emergency vehicle get way to go.



D. Hardware module:

The Hardware module of project shows simulation of our project. It include RFID reader, signal PCB, Microcontroller PCB it has ATmega232 Microcontroller, MAX 232 and DB9 connector which is used for serial communication with PC.



E. Android App:

In this app we have to enter IP address of machine, we have to select signal and also select location and then click on proceed button it will show Bluetooth device name we have to select it.



A. Algorithm to Handle Deadlock:

Deadlock occur when two or more than two emergency vehicles occur at the same time for same signal. That time deciding priority to emergency signal can be done with the help of history of that particular road. That means data of the emergency vehicle can be maintained of that particular road. That data contained the emergency vehicle count. For that purpose we are developing algorithm:

Let $H[]$ be the history count of vehicles(emergency vehicles)

Now calculate max index from array

Initialize $\text{max_value}=0$ and $\text{max_index}=-1$

For($i=0$ to length of H)

Check if $H[i] > \text{max_value}$

$\text{Max_value}=H[i]$

$\text{Max_index}=i$

End

End for

Now i th signal has maximum number of emergency vehicles. Then allow to pass the green signal.

Result and analysis

The proposed system have result such as find out the coming vehicle is emergency vehicle, normal vehicle or stolen vehicle if it is emergency vehicle then control signal, if it is stolen vehicle generate alert and capturing Environment parameters like temperature, moisture of particular area by using temperature sensor and moisturation sensor. Analysis can be done by comparing with current system. If at the time Emergency vehicle RFID no capture by all RFID reader at chowk then it is handle by looking historical data. If at the time N numbers of emergency vehicle come then problem arises.

3. CONCLUSION

In this paper, we have proposed the system which will be helpful to all emergency vehicles which are stuck in traffic because of that they will not reach to destination at time and maintain log of stolen vehicles. It ensures that Emergency vehicles reach to destination within time. Current system is manual and time consuming.

Also we have used RFID tags and Reader it takes less time to categorize the vehicles and at a time it reads RFID tags within milliseconds. We developed an algorithm that helps in avoiding deadlock at a junction. No current system guarantees quick service than this proposed system. It brings automation in a manual system. The system is reusable.

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